EFFECT OF MATING ON THE ONSET AND DURATION OF OVULATION IN THE SOW

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Mating has been shown to have effects on ovulation in a number of species which ovulate spontaneously, such as rats (Aron, Asch & Asch, 1961; Aron, Asch & Ross, 1966; Zarrow & Clark, 1968) and sheep (Parsons, Hunter & Rayner, 1967; Van der Westhuysen, Van Niekerk & Hunter, 1970). In the sow, the results obtained by Pitkjanen (1955) and Lebedev (1957) suggest that mating hastens ovulations and shortens the time during which ova are liberated. Direct inspection of the ovaries by coelioscopy (Locatelli, 1971) allows rapid and accurate determination of the time of ovulation and causes minimal trauma. By this technique, the earlier results have been confirmed in a preliminary experiment (Signoret, 1970).

The present experiment was designed to show by how many hours mating advances ovulation and shortens its total duration.

Fifty-nine Large White gilts were mated at the time of the second oestrus following withdrawal of methallibure (I.C.I.), which had been given for 21 days (100 mg/day in the feed) in order to control ovulation and to facilitate detection of the time of ovulation. The gilts were mated at the first sign of oestrus, and again 6 hr later, by boars of known fertility. They were then randomly assigned to one of four experimental groups in which coelioscopy took place 30, 35, 40 and 45 hr, respectively, after the onset of oestrus.

The time of ovulation in this group (A) was compared with that in a group of thirty-seven unmated gilts (B) given a single injection of PMSC 24 hr after the last treatment with methallibure, and in a second control group (C) of seventy-four unmated gilts on their second oestrus following withdrawal of methallibure. The findings in these last two groups have already been reported (du Mesnil du Buisson, Mauléon, Locatelli & Mariana, 1970). Oestrus was detected by teaser boars put with the gilts for a few minutes every 6 hr (Signoret, 1967).

The results are summarized in Table 1. By probit analysis (Finney, 1962), the median time between the beginning of oestrus and the start of ovulation was found to be 34.1 hr in the mated animals (A) and 38.0 hr in the controls (C). In the two groups, ovulations finished 35.0 hr and 41.8 hr, respectively, after the start of oestrus.

Thus after two copulations, the median time for the onset of ovulation was 3.9 hr earlier than in the unmated animals and the duration of ovulation was reduced by 2.8 hr (Text-fig. 1).

It has been suggested that the effects of stimuli associated with mating could be mediated by modifications in the patterns of discharge of pituitary gonado-

TABLE 1
THE TIME OF OVULATION IN GILTS DURING OESTRUS

Treatment	Ovarian response	Time interval from onset of oestrus to coelioscopy (hr)					Probit lines
		30	35	40	45	50	
Mated 0 hr and 6 hr after onset of oestrus (Group A)	Ovulation completed (1)	4/14	8/14	9/14	15/15	—	$y_1 = 0.83 + 0.12 \times$ DE 50 = 35.03 hr
	Ovulation in progress (2)	0	0	3/16	0	—	
	No ovulation (3)	10/14	6/14	4/16	0	—	$y_2 = 10.18 - 0.15 \times$ DE 50 = 34.06 hr
Unmated (Group C)	Ovulation completed (1)	1/14	4/15	4/16	9/15	14/14	$y_1 = -0.72 + 0.14 \times$ DE 50 = 41.77 hr
	Ovulation in progress (2)	0	2/15	5/16	4/15	0	
	No ovulation (3)	13/14	9/15	7/16	2/15	0	$y_2 = 11.37 - 0.17 \times$ DE 50 = 37.95 hr

(1) All large follicles ruptured (DE 50 = mean time of onset of ovulation).

(2) Some large follicles not ruptured.

(3) No follicle ruptured (DE 50 = mean time of end of ovulation).

TEXT-FIG. 1. Percentage of sows ovulating (as probit) at different times after the onset of oestrus.

trophins that take place within the first 8 hr after the onset of oestrus (Niswender, Reichert & Zimmerman, 1970). A single injection of PMSG also reduces the duration of ovulation (Group B) (du Mesnil du Buisson *et al.*, 1970) (Table 2).

Our results differed from those of Zimmerman & Naber (1971) who found that two copulations 12 hr apart did not affect the time of onset or the duration of ovulation. It is possible that we have obtained different results because multiple matings may not affect ovulation unless they occur during the short

TABLE 2
EFFECT OF PMSG ON THE TIME OF OVULATION IN GILTS

Treatment	Ovarian response	Time interval from onset of oestrus to coelioscopy (hr)					Probit lines
		30	35	40	45	50	
PMSG (750 i.u.) 24 hr after the last treatment with methallibure (Group B)	Ovulation completed (1)	0	0	1/8	4/6	4/4	$y_1 = 0.29 + 0.12 \times$ DE 50 = 43.57 hr
	Ovulation in progress (2)	1/9	2/10	1/8	0	0	
	No ovulation (3)	8/9	8/10	6/8	2/6	0	$y_2 = 42.04 - 0.10 \times$ DE 50 = 43.39 hr

(1) All large follicles ruptured (DE 50 = mean time of onset of ovulation).

(2) Some large follicles not ruptured.

(3) No follicle ruptured (DE 50 = mean time of end of ovulation).

time during which the rate of LH discharge is increasing at the beginning of oestrus (Niswender *et al.*, 1970).

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